

Code No.

T – 2120

**Entrance Examination for Admission to the P.G. Courses in the
Teaching Departments, 2024**

CSS

**COMPUTATIONAL BIOLOGY WITH SPECIALIZATION IN (COMPUTER
AIDED DRUG DESIGN/NGS DATA ANALYTICS)**

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General Instructions

1. The Question Paper is having 100 Objective Questions, each carrying one mark.
2. The answers are to be (✓) 'tick marked' **only** in the "Response Sheet" provided.
3. **Negative marking : 0.25 marks** will be deducted for each wrong answer .

Time : 2 Hours

Max. Marks : 100

To be filled in by the Candidate									
Register Number	in Figures								
	in words								

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Choose appropriate answer from the options in the questions.

(100 × 1 = 100 marks)

1. Which one of the following conditions will switch on Lac operon in E. coli?
 - A. + Glucose, + Lactose
 - B. + Glucose, – Lactose
 - C. – Glucose, – Lactose
 - D. – Glucose, + Lactose

DO NOT WRITE HERE

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2. Adenosine, guanosine, thymidine, uridine, uridine are all _____ but adenylic acid, guanylic acid, thymidylic acid, uridylic acid, cytidylic acids are _____.
- A. Nucleotides, Nucleosides B. Nucleosides, Nucleotides
C. Nucleotides, Nucleic acids D. Nucleosides, Nucleic acids
3. In a DNA molecule, the phosphate group is attached to carbon of the sugar residue of its own nucleotide and _____ carbon of the sugar residue of the next nucleotide by _____ bonds.
- A. 5', 3', phosphodiester B. 5, 3', glycosidic
C. 3', 5', phosphodiester D. 3', 5', glycosidic

4. Pyrimidines have nitrogen atoms at _____ positions.
- A. 1', 3', 7', 9' B. 1', 5', 7', 9'
C. 1', 3' D. 1', 9'
5. On a ribosome, the mRNA is read from _____ and the polypeptide chain is synthesized from _____.
- A. 3' to 5'; C to N terminus B. 3' to 5'; N to C terminus
C. 5' to 3'; N to C terminus D. 5' to 3'; C to N terminus
6. During DNA replication the synthesis of leading strand of DNA results in fragments known as:
- A. Satellite segments B. Kornberg segment
C. Double-helix segment D. Okazaki fragment
7. Eukaryotic RNA polymerase II transcribes:
- A. rRNA and tRNA genes B. mRNA and tRNA genes
C. mRNA and 5S rRNA genes D. mRNA, miRNA and snRNA genes
8. The melting temperature (t_m) of DNA is higher when the content of:
- A. A : T base pairs is higher
B. G : C base pairs is higher
C. G : C base pairs is lower
D. A : T base pairs is same as G : C base pairs
9. The mRNA codon of valine is:
- A. UGG B. GUG
C. CCA D. TTG
10. On sequence analysis of a double stranded DNA, the results showed the content of cytosine, C was 20%. What is the amount of A and T put together?
- A. 20% B. 30%
C. 50% D. 60%

19. In cytoplasm, synthesis of protein at ribosomes is called:
- A. Translation
 - B. Transcription
 - C. Replication
 - D. Transduction
20. The first protein sequenced by Frederick Sanger was:
- A. Insulin
 - B. Hemoglobin
 - C. Myosin
 - D. Myoglobin
21. What is the purpose of the “if” statement in programming?
- A. To repeat a block of code
 - B. To define a function
 - C. To make a decision based on a condition
 - D. To declare a variable
22. #include <stdio.h>
- ```
int main()
{
 int i = 1,2,3;
 printf(“%d”, i);
 return 0;
}
```
- A. 1
  - B. 3
  - C. Garbage value
  - D. Compile time error
23. In relational databases, which term uniquely identifies each row in a table?
- A. Attribute
  - B. Tuple
  - C. Primary Key
  - D. Foreign Key
24. What is the binary equivalent of the decimal number 42?
- A. 100100
  - B. 101010
  - C. 110110
  - D. 111010

25. What term describes a blueprint for creating objects in object-oriented programming?
- A. Class
  - B. Object
  - C. Method
  - D. Attribute
26. \_\_\_\_\_ is a type of memory circuitry that holds the computer's start-up routine.
- A. RIM (Read Initial Memory)
  - B. RAM (Random Access Memory)
  - C. ROM (Read Only Memory)
  - D. Cache Memory
27. An ASCII is a character-encoding scheme that is employed by personal computers in order to represent various characters, numbers and control keys that the computer used selects on the keyboard. ASCII is an acronym for
- A. American Standard Code for Information Interchange
  - B. American Standard Code for Intelligent Information
  - C. American Standard Code for Information Integrity
  - D. American Standard Code for Isolated Information
28. Which data structure follows the Last In, First Out (LIFO) principle?
- A. Queue
  - B. Stack
  - C. Linked List
  - D. Array
29. Which protocol is used for secure communication over a computer network, providing encrypted connections?
- A. FTP
  - B. HTTP
  - C. SSH
  - D. Telnet
30. Which among the following is not a security/privacy risk?
- A. Spam
  - B. Virus
  - C. Hacking
  - D. Phishing
31. A compiler is used to convert the following to object code which can be executed
- A. Low level language
  - B. Assembly language
  - C. High level language
  - D. Natural Language





46. TATA box is  
 A. Recognised by RNA polymerase    B. Recognised by transcription factors  
 C. Is present in the operator region    D. All the above
47. \_\_\_\_\_ is/are required for RNA capping.  
 A. RNA 5' triphosphatase                      B. Guanine-7-methyl transferase  
 C. 2'-O-methyl transferase                      D. All the above
48. Small Nuclear Ribonuclear proteins  
 A. contain RNA                                      B. are part of spliceosomes  
 C. are ribozymes                                      D. All the above
49. RNase activity is exhibited by  
 A. Drosha                                              B. Telomerase  
 C. Rho                                                  D. All the above
50. Upstream regulatory elements comprise of  
 A. Transcription factors  
 B. Factors that enhances DNA replication  
 C. Enhancers and silencers  
 D. 5' UTR
51. Which of the following is a polymerase?  
 A. *HindIII*                                              B. *Pfu*  
 C. *Tfl*                                                      D. Cas9
52. Match list A with list B
- | A                                         | B                                         |
|-------------------------------------------|-------------------------------------------|
| (i) Cas9                                  | (1) Ribozyme                              |
| (ii) Terminal uridylyl transferase        | (2) Methylation                           |
| (iii) Telomerase                          | (3) Genome editing                        |
| (iv) Methyl transferase                   | (4) RNA editing                           |
| A. (i)-(3), (ii)-(1), (iii)-(4), (iv)-(2) | B. (i)-(4), (ii)-(3), (iii)-(1), (iv)-(2) |
| C. (i)-(3), (ii)-(4), (iii)-(1), (iv)-(2) | D. (i)-(4), (ii)-(3), (iii)-(2), (iv)-(1) |



61. DNA primase is a
- A. DNA polymerase
  - B. Recombinase
  - C. RNA polymerase
  - D. DNA helicase
62. An aircraft flies 930 miles in 75 minutes. How many miles does it fly in 4 hours 45 minutes assuming a constant speed?
- A. 3112
  - B. 3477
  - C. 3534
  - D. 3522
63. A tap can empty a tank in 30 minutes while a second tap can empty it in 20 minutes. If both the taps are kept open, how much time is required to empty the tank?
- A. 20 minutes
  - B. 12 minutes
  - C. 25 minutes
  - D. 55 minutes
64. A train starts from A towards B with a speed 75km/h. Another train starts from B with a speed of 60km/h towards A. Both of them meet after 12 minutes. Find the distance between A and B
- A. 30 km
  - B. 65 km
  - C. 25 km
  - D. 27 km
65. Two metro trains start at the same time from the same station 300km apart going in opposite directions cross each other at a distance of 180 km. What is the ratio of their speeds?
- A. 3 : 2
  - B. 3 : 4
  - C. 2 : 3
  - D. 4 : 5
66. Identify the number in this series; 8, 6, 9, 23, 87,... What number should come next?
- A. 126
  - B. 429
  - C. 324
  - D. 249
67. Which of the following is NOT a database management software?
- A. MySQL
  - B. Oracle
  - C. SQL
  - D. Pascal





81. \_\_\_\_\_ has the highest pH value.
- A. Water  
B. Wine  
C. Caustic soda  
D. Lime juice
82. Which of the following bonds electrons are transferred?
- A. Covalent  
B. Ionic  
C. Hydrogen  
D. None of these
83. KBJ, LCK, MDL, NEM, .....
- A. OEP  
B. OFN  
C. MEN  
D. PFQ
84. An examination of 3hr duration has 200 questions of which 50 are physics problems. It is stated that twice as much time be spent on each physics problem as for each other question. How many minutes are to be spent on the physics problems.
- A. 36  
B. 72  
C. 60  
D. 100
85. A boat is moving upstream with velocity of 14 km/hr and goes downstream with a velocity of 40 km/hr, calculate the speed of the stream?
- A. 13 km/hr  
B. 26 km/hr  
C. 34 km/hr  
D. None of these
86. What is the smallest number by which 2880 must be divided in order to make it into a perfect square?
- A. 3  
B. 4  
C. 5  
D. 6
87. DNN, FPP, HRR, \_\_\_\_\_, LVV
- A. GRR  
B. OSS  
C. JTT  
D. ITT
88. Statement 1 : Pens cost more than pencils.  
Statement 2 : Pens cost less than erasers.  
Statement 3 : Erasers cost more than pencils and pens.  
If the first two statements are true, the third statement is
- A. True  
B. False  
C. Uncertain  
D. Cannot be determined





## ANSWER SHEET

|    |   |   |   |   |   |    |   |   |   |   |   |    |   |   |   |   |   |     |   |   |   |   |   |
|----|---|---|---|---|---|----|---|---|---|---|---|----|---|---|---|---|---|-----|---|---|---|---|---|
| 1  | A | B | C | D | E | 26 | A | B | C | D | E | 51 | A | B | C | D | E | 76  | A | B | C | D | E |
| 2  | A | B | C | D | E | 27 | A | B | C | D | E | 52 | A | B | C | D | E | 77  | A | B | C | D | E |
| 3  | A | B | C | D | E | 28 | A | B | C | D | E | 53 | A | B | C | D | E | 78  | A | B | C | D | E |
| 4  | A | B | C | D | E | 29 | A | B | C | D | E | 54 | A | B | C | D | E | 79  | A | B | C | D | E |
| 5  | A | B | C | D | E | 30 | A | B | C | D | E | 55 | A | B | C | D | E | 80  | A | B | C | D | E |
| 6  | A | B | C | D | E | 31 | A | B | C | D | E | 56 | A | B | C | D | E | 81  | A | B | C | D | E |
| 7  | A | B | C | D | E | 32 | A | B | C | D | E | 57 | A | B | C | D | E | 82  | A | B | C | D | E |
| 8  | A | B | C | D | E | 33 | A | B | C | D | E | 58 | A | B | C | D | E | 83  | A | B | C | D | E |
| 9  | A | B | C | D | E | 34 | A | B | C | D | E | 59 | A | B | C | D | E | 84  | A | B | C | D | E |
| 10 | A | B | C | D | E | 35 | A | B | C | D | E | 60 | A | B | C | D | E | 85  | A | B | C | D | E |
| 11 | A | B | C | D | E | 36 | A | B | C | D | E | 61 | A | B | C | D | E | 86  | A | B | C | D | E |
| 12 | A | B | C | D | E | 37 | A | B | C | D | E | 62 | A | B | C | D | E | 87  | A | B | C | D | E |
| 13 | A | B | C | D | E | 38 | A | B | C | D | E | 63 | A | B | C | D | E | 88  | A | B | C | D | E |
| 14 | A | B | C | D | E | 39 | A | B | C | D | E | 64 | A | B | C | D | E | 89  | A | B | C | D | E |
| 15 | A | B | C | D | E | 40 | A | B | C | D | E | 65 | A | B | C | D | E | 90  | A | B | C | D | E |
| 16 | A | B | C | D | E | 41 | A | B | C | D | E | 66 | A | B | C | D | E | 91  | A | B | C | D | E |
| 17 | A | B | C | D | E | 42 | A | B | C | D | E | 67 | A | B | C | D | E | 92  | A | B | C | D | E |
| 18 | A | B | C | D | E | 43 | A | B | C | D | E | 68 | A | B | C | D | E | 93  | A | B | C | D | E |
| 19 | A | B | C | D | E | 44 | A | B | C | D | E | 69 | A | B | C | D | E | 94  | A | B | C | D | E |
| 20 | A | B | C | D | E | 45 | A | B | C | D | E | 70 | A | B | C | D | E | 95  | A | B | C | D | E |
| 21 | A | B | C | D | E | 46 | A | B | C | D | E | 71 | A | B | C | D | E | 96  | A | B | C | D | E |
| 22 | A | B | C | D | E | 47 | A | B | C | D | E | 72 | A | B | C | D | E | 97  | A | B | C | D | E |
| 23 | A | B | C | D | E | 48 | A | B | C | D | E | 73 | A | B | C | D | E | 98  | A | B | C | D | E |
| 24 | A | B | C | D | E | 49 | A | B | C | D | E | 74 | A | B | C | D | E | 99  | A | B | C | D | E |
| 25 | A | B | C | D | E | 50 | A | B | C | D | E | 75 | A | B | C | D | E | 100 | A | B | C | D | E |

## **ROUGH WORK**

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